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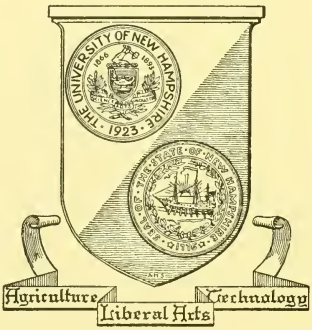
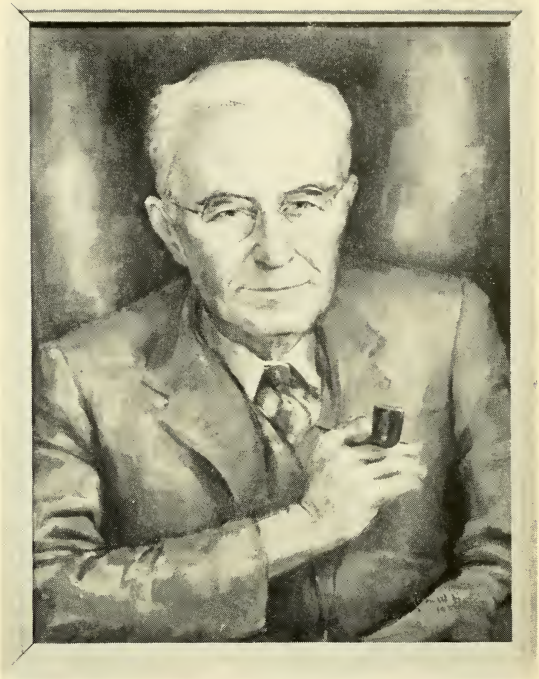


The University
of
New Hampshire

Station
Bulletin
429

June
1956



Report of the Director

OF THE

New Hampshire Agricultural Experiment Service

UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NEW HAMPSHIRE

Cover Picture

Ernest George Ritzman served the University of New Hampshire for 40 years; as Research Professor of Animal Husbandry from 1915 to 1946 and as Emeritus Professor from 1946 to 1955. Born in Switzerland, he came to the United States at the age of seven and with his parents settled on a farm in Iowa. He received his schooling in that state. Immediately following his graduation from Iowa State College in 1903, with a B.S. in Agriculture, he began his professional career in his chosen field of animal husbandry. He was associated with the Bureau of Animal Industry, U.S.D.A., for 5 years and from 1908 to 1915 he served as Animal Husbandman in charge of animal breeding research at the Puerto Rico Agricultural Experiment Station.

During his career at the University of New Hampshire, Professor Ritzman, in cooperation with the Carnegie Institution of Washington, initiated and directed basic research in the field of protein and energy metabolism of farm animals. The reputation of the Nutrition Laboratory was so firmly established through the outstanding contributions of Professor Ritzman and his associates that it has brought signal honor in national and international recognition to the University of New Hampshire.

Professor Ritzman was awarded an honorary Master of Science degree in 1928 by the University of New Hampshire. On May 15, 1955, death marked the end of his outstanding career.

The picture is a copy of a portrait by Professor John W. Hatch of the Department of The Arts at the University. It was the gift of the many friends of Professor Ernest George Ritzman. It hangs in the Nutrition Laboratory at the University where he devoted so many years of his life to the science of agriculture.

Foreword

This Bulletin conveys the 67th annual report of the Director of the New Hampshire Agricultural Experiment Station. Contained herein are lists by departments of the nearly 90 formal projects active during the fiscal year ended June 30, 1955. Each project title is accompanied with a number for identification and with the names of the contributing professional staff. Also included in the report are a statement of receipts and expenditures, a summary of State Services, a roster of personnel, and a list of publications.

On page three of the 66th annual report, Bulletin 418, the Director explained that a new periodical, *Progress Report,* would replace the reports of progress customarily contained in the annual report. Consequently, this 67th annual report omits this more voluminous material, and embodies only the number, title, and personnel for each formal active research project.

One of the most significant characteristics of the United States economy is the small proportion of our population living on farms, now only about 12 percent, compared with about 40 percent at the turn of the century. No other country has experienced such progress. Land in the United States has been plentiful and labor has been scarce, relatively. Agricultural research has provided the know-how for more efficient production, marketing, and processing of food and fiber. More know-how combined with technological improvements and mechanization has created in the United States the most effective and efficient commercial farm units for the production of food the world has ever known. Production per man, not production per acre, has been and is the important thing.

Interdepartmental cooperation is characteristic of much of the research at this Experiment Station. When a project outline is prepared, and during its activation, members of various departments are called on when the work demands their attention. By this means the project can be sufficiently broad to cover many aspects of the problem. The personnel are aware of the need for efficient research — accomplishment per dollar expended. By this means society is assured of a large return on its investment in agricultural research.

Many public, private, and industrial organizations have contributed to the program of the New Hampshire Agricultural Experiment Station. We acknowledge these gifts with gratitude.

The publications of the Station consist of bulletins, reports, reprints of scientific articles and mimeographs. These may be obtained from the Mailing Clerk upon request.

Harold C. Grinnell
Director

Mathias C. Richards
Associate Director

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Active Research Projects

July 1, 1954 — June 30, 1955

Administration

H-31 General Organization and Direction of Research. H. C. Grinnell, M. C. Richards.

Agricultural and Biological Chemistry

A-31 The Carbohydrates of Pasture Grasses. T. G. Phillips, Margaret Loughlin.

A-39 Soluble Substances in Grass and Legume Silages. T. G. Phillips, Margaret Loughlin.

A-43 A Microbiological Method for the Nutritional Evaluation of Proteins. A. E. Teeri, Dorothy Josselyn, Margaret Loughlin.

A-44 Determination of Calcium and Magnesium in Plant Material. W. Averill.

A-45 The Hemicellulose of Forage Crops. T. G. Phillips.

BJ9-8 Effect of Soil Type and Mineral Additions on the Mineral Content of Clover and Timothy. G. P. Percival, Dorothy Josselyn.

BJ9-14B Analysis of Forage Samples. G. P. Percival, Dorothy Josselyn.

BJ9-34 Prevention of Discoloration of Pre-peeled Raw Potatoes. W. Averill.

S-52 The Nutritive Value of Fish and Other Marine Products. A. E. Teeri.

Agricultural Economics

P-111 A Study of the Farm Management Problems of Potato Production in New Hampshire. W. K. Burkett.

P-114 A Study of the Problems of Obtaining Farming Capital. W. K. Burkett.

BJ9-22 Marketing Mixed Grain Feed. George Rogers.

BJ9-25, NEM-11 Costs and Efficiency in Marketing Poultry Products. W. F. Henry, Joseph Gartner.

BJ9-27, NEM-3 Merchandising Methods for and Sales of Squash in Retail Stores. L. A. Dougherty.

BJ9-43, NEM-13 Alternative Markets and Prices for New Hampshire Milk Produced in Excess of Fluid Requirements with Particular Reference to the Boston Milkshed. J. R. Bowring.

BJ9-44, NE-31 The Extent of Migration and Its Effect on Rural Communities in New Hampshire. J. R. Bowring, O. B. Durgin.

S-44 Cost Reduction in Dairying. W. F. Henry.

S-50 Effects of Reservoir Construction on the Agricultural Economy of the Reservoir and Downstream Areas. W. F. Henry, W. K. Burkett, George Rogers, Joseph Gartner.

S-58 The Structure and Competitive Position of the New England Apple Industry with Particular Reference to New Hampshire. Joseph Gartner.

S-61 Evaluation of Methods of Improvement in Decision Making. O. B. Durgin.

Agricultural Engineering

S-57 Patterns of Droughts and Their Frequency in New Hampshire. R. S. Palmer.

Agronomy

H-32 The Adaptation of New Potato Varieties. P. T. Blood.

H-33 Variety Trials of Grain Crops for Forage and Grain Yields. L. J. Higgins.

P-12 Rotation, Fertility, and Cultural Experiments with Potatoes in New Hampshire. P. T. Blood, F. S. Prince.

P-84 The Influence of the Level of Available Potash in the Soil on the Longevity or Persistence of Ladino Clover in Hay Stands. R. L. Donahue, F. S. Prince.

P-93 The Improvement of Ladino Clover, Red Clover, and Timothy by Selection and Breeding. G. M. Dunn, L. J. Higgins, D. A. Emery.

BJ5-26 The Influence of Irrigation on Pasture Production Under New Hampshire Conditions. P. T. Blood, R. S. Palmer.

BJ5-32 The Influence of Fertilization and Stage of Cutting on the Yield, Persistency and Protein Content of Bromegrass (*Bromus inermis*). R. L. Donahue, P. T. Blood.

BJ9-9 The Influence of Soil Type on the Persistence of Perennial Legumes. A. B. Prince, R. L. Donahue.

BJ9-30, NE-11 The Influence of Deep Tillage and Fertilizer Placement on Soil Structure and Crop Production on Soils with Compact Subsoils. Scott Miller, A. B. Prince, M. Townsend.

BJ9-41, NE-11 Evaluation of Soil Physical Conditions that are Favorable to the Yield of Crops. Scott Miller.

BJ9-42, NE-21 The Adaption and Productivity of Regionally Developed Selections and Strains of Smooth Bromegrass as Related to Morphologic and Physiologic Characteristics. G. Dunn.

S-43 A Survey of the Soils of New Hampshire. W. Lyford.

S-54 Soil Fertility Studies of Forage Crops. R. L. Donahue.

S-59 An Economic Evaluation of Forage Production and Utilization with Emphasis on Pastures. F. S. Prince.

Bacteriology

P-56 Studies on Bovine Mastitis. L. W. Slanetz, F. E. Allen, G. A. Coronis.

P-120 Investigations on the Microorganisms of the Bovine Rumen. W. A. Ayers.

Botany

H-34 Testing Tomato Varieties for Resistance to the Late Blight Pathogen. A. E. Rich.

A-42 Propagation of Woody Plants. Stuart Dunn, Judith Dorr.

P-109 Fungicide Investigations. A. E. Rich, R. F. Becker.

P-121 Virus Diseases of Strawberries in New Hampshire. A. E. Rich, R. F. Becker.

BJ5-24 The Use of Wood Wastes, such as Sawdust and Lignin, in Compost with Soil and Manure and Their Effect on Plant Growth. Stuart Dunn, Judith Dorr.

BJ5-31 The Effects on Vegetation of Weed-Control Measures Applied to Woody Plant Areas. A. R. Hodgdon.

BJ9-38, NE-12 Light and Temperature Effects on Phytotoxicity with Respect to Herbicides. Stuart Dunn, S. Datta.

BJ-9-39 Effects of Light Quality on Plant Growth. Stuart Dunn, Judith Dorr.

S-30 The Flora of New Hampshire. A. R. Hodgdon.

S-46 Plant Disease Investigation. A. E. Rich.

Dairy Husbandry

P-95 The Relationship Between the Diet of Dairy Animals, the Activity of the Flora of the Digestive Tract, and the Utilization of Protein and Energy. N. F. Colovos, A. E. Teeri, H. A. Davis, Dorothy Josselyn, Barbara Sanders, A. D. Littlehale.

BJ5-21 The Influence of Herd Management Practices on Milk Production, Efficiency of Reproduction, and Herd Replacement Maintenance. K. S. Morrow.

BJ5-29 The Relation of Seminal Fluid Fructose Levels to Factors Affecting Breeding Efficiency. H. Boynton.

BJ9-14 Maximum Use of Roughage in Feeding Dairy Cattle. H. A. Keener, Barbara Sanders, A. D. Littlehale.

BJ9-14A, NE-1 The Effect of the Maximum Use of Roughage Upon the Reproductive Efficiency of Dairy Cattle. H. A. Keener, Barbara Sanders, A. D. Littlehale.

BJ9-33 Package Milk Vending Machines as a Means of Increasing Fluid Milk Sales. H. C. Moore.

S-60 The Use of Citrus Pulp to Reduce Cost of Concentrates in Feeding Dairy Cattle. H. A. Keener.

Entomology

A-41 Factors Affecting the Action of Acaricides. R. L. Blickle, W. J. Morse.

P-110 Testing New Organic Insecticides Under New Hampshire Conditions. J. G. Conklin, R. L. Blickle, W. J. Morse.

S-34 Insect Record. J. G. Conklin, W. J. Morse.

S-35 Control of Apple Maggot and Certain Other Economic Insects. J. G. Conklin.

S-36 Studies on the Ecology of European Spruce Saw-Fly. J. G. Conklin.

Forestry

P-119 Soil Yield Relationships of White Pine in Southern New Hampshire. Bertram Husch.

BJ5-33 The Relationship of the Growth of White Pine in New Hampshire to Selected Environmental Characteristics. Bertram Husch.

BJ9-29, NEM-6 Marketing Forest Products in New Hampshire. L. C. Swain.

BJ9-37 The Utilization of Products from Chemically Treated Trees. L. C. Swain, O. P. Wallace.

S-1 Reproduction Studies. C. L. Stevens.

S-51 Relation of Available Labor to Woodlot Income on New Hampshire Dairy Farms. .O. P. Wallace.

Home Economics

BJ9-32, NE-16 The Effect of Varying Intake Levels of Phosphorus on Blood Sugar and on Blood and Urinary Thiamine. Anna Light, S. R. Shimer, W. Averill, Beth Byers.

BJ9-46, NE-19 Color Change in White Dacron Blouses. June Ericson.

Horticulture

H-37 Variety Tests of Fruits and Vegetables. A. F. Yeager, L. P. Latimer, E. M. Meader, B. Barmby.

H-38 Improvement of Ornamental Plants. E. B. Risley.

H-39 Cultural Studies with Horticultural Crops. R. Eggert, L. P. Latimer, E. M. Meader, B. Barmby.

A-35 Temperature Relations in Horticultural Plants Under New Hampshire Conditions. R. Eggert, B. Barmby.

A-36 Nutritional Studies with Horticultural Plants. L. P. Latimer,. R. Eggert, G. P. Percival, Dorothy Josselyn.

P-105 Breeding Better Vegetables for New Hampshire. E. M. Meader, A. F. Yeager, Shi-an-Yu, W. Averill.

P-108 The Development, Improvement and Maintenance of Blueberry Fields. W. W. Smith.

BJ5-9 The Use of Rootstocks and Interstocks as a Means of Securing Smaller, Hardier, and More Productive Apple Trees. W. W. Smith.

BJ9-12 Breeding Improved Fruits for New Hampshire. A. F. Yeager, E. M. Meader, Charlotte Nast, Shi-an-Yu, S. Majumder.

BJ9-35, NE-9 The Testing and Utliization of New Plant Materials in New Hampshire. A. F. Yeager.

S-38 Nut Improvement. A. F. Yeager.

P-102 The Inheritance of Feed Utilization Efficiency in Poultry. W. M. Collins, F. Cherms, G. E. Wood.

P-103 Breeding for Meat-Type in Chickens. W. M. Collins, W. C. Skoglund, F. Cherms.

P-107 Efficiency of Feed Utilization in Poultry Production. R. C. Ringrose.

P-117 Problems Involved in the Vaccination of Infectious Bronchitis. W. R. Dunlop.

BJ9-10 A Study of Methods in the Development and Management of Pastures for Growing Pullets. R. C. Ringrose.

BJ9-20, NE-5 The Control of Newcastle Disease and Allied Respiratory Diseases in Poultry. W. R. Dunlop.

BJ9-26 Factors Influencing the Market Quality of Eggs on New Hampshire Farms. W. C. Skoglund.

BJ9-36, NE-8 Influence of Light and Humidity Upon the Physical Condition of Broilers. W. C. Skoglund.

BJ9-40, NE-6 Selection for General and Specific Combining Ability for Growth Rate. W. M. Collins, F. Cherms.

S-55 Factors Influencing Sexual Maturity of Pullets. R. C. Ringrose.

S-56 The Effect of Low Level Chemotherapeutic Drugs in the Control of Coccidiosis in Growing Birds and Their Subsequent Performance in the Laying House. W. R. Dunlop.

State Services

Inspection of Fertilizers and Feedingstuffs

In accordance with State laws regulating the sale of fertilizers and fertilizer materials, 120 samples were analyzed. Of these, 79 were complete fertilizers, the balance supplied one or two plant nutrients in each case. Of the total number, 69 equalled or exceeded the guarantees in all respects. In general, the deficiencies found were small. The fertilizer manufacturers are doing a good job in providing a good product that, when used as recommended, should be satisfactory. Detailed results of the analysis of these samples are published in Bulletin 414 of this Station.

A total of 710 official samples of feedingstuffs were submitted for analysis as a part of the State program of inspection of feedingstuffs offered for sale. Of these, 649 represented livestock and poultry feeds and 61 represented dry or canned cat and dog food. The products of 101 manufacturers were inspected. The deficiencies found were in general small. 10.3 percent were deficient in protein, 6.9 percent were deficient in fat and 5.9 percent contained an excess of crude fiber compared to the guarantee. Detailed results of the analyses are published in Bulletin 421 of this Station.

To check on the accuracy and effiectiveness of methods used in the laboratory, two series of check samples were analyzed during the year. One series of 15 samples was supplied by the American Oil Chemists

Society and the other, a series of six samples, by the Association of Feed Control Officials. More than 100 laboratories analyze these samples and our laboratory stands very well in relation to others reporting on this work.

We have continued collaborative work with the Association of Official Agricultural Chemists in the development and improvement of analytical methods. This laboratory is especially concerned with the development of methods for determining nitrogen in fertilizers.

Numerous inquiries by residents of the State have been made, and answers supplied concerning feed and fertilizers. Many of these inquiries can be answered without analytical work. However, a limited number of such analyses are made each year in specialized cases.

H. A. Davis

Seed Inspection

Seed inspection work for the New Hampshire State Department of Agriculture was conducted during the past year. The results of the tests of 575 official samples collected by the State Seed Inspectors throughout the State are reported in Station Bulletin 422. In addition, 1,052 private samples were sent in by seed dealers and farmers, making a total of 1,627 samples handled at the laboratory.

The laboratory took part in the referee testing for germination of 25 samples sent out to all official laboratories in United States and Canada.

Bessie G. Sanborn

Soil Testing

During the last fiscal year, residents of the State have submitted 4,234 soil samples for analysis of pH values and available nutrients. This work entailed 30,094 determinations. Thirty-three soil samples from greenhouses were tested for soluble matter and soluble salts, entailing 132 determinations. Ten peat and muck samples submitted for identification and for possible commercial use were analyzed for moisture, organic matter content, and for pH value.

G. P. Percival

Diagnostic Service Performed at the Poultry Laboratory

From July 1, 1954, to June 30, 1955, a total of 4,433 specimens of all kinds were submitted to the Poultry Laboratory for diagnosis. These represented 2,036 cases.

A total of 3,994 chicken specimens, 64 turkeys, and 62 miscellaneous birds were examined. Fifty-three cases consisting of 60 specimens from various animals were also handled by Laboratory personnel. There were 303 cases of blood samples submitted for immunity tests.

A. C. Corbett, Richard Strout, W. R. Dunlop, F. E. Allen

Pullorum Testing

Testing of poultry for pullorum disease in the State is done by the Poultry Laboratory at the University. During the fiscal year, 1,362.555 birds were tested by means of the tube-agglutination test.

In addition, 43,621 samples were retested, thus giving a total of 1,406.175 samples tested for the year.

Of 414 flocks tested, one was found to harbor infection. Thus .00044 percent of the birds under test were infected.

A. C. Corbett, F. E. Allen, W. R. Dunlop

Infectious Bronchitis Virus

The Poultry Laboratory has continued to grow infectious bronchitis virus on embryonating eggs, and after being tested for purity and potency it is sold to poultrymen of the State for inoculation of their susceptible birds. During the fiscal year, 535 lots of this virus were supplied to New Hampshire poultrymen.

A. C. Corbett, F. E. Allen, W. R. Dunlop

Dairy Bacteriological Testing

During the year 1954-55 456 milk test bottles and 90 pipettes were calibrated.

Other services covered under Dairy Bacteriology Testing include the supplying of the Babcock glassware to the D.H.I.A. testers.

H. C. Moore

New Hampshire Agricultural Experiment Station Staff

June 30, 1955

Administration

HAROLD C. GRINNELL, PH.D., Director
MATHIAS C. RICHARDS, PH.D., Associate Director
RUSSELL C. SMITH, B.A., Purchasing Assistant
NORMAN W. MYERS, B.A., Acting Treasurer
L. FRANKLIN HEALD, B.A., Editor
HENRY W. CORROW, JR., B.S., Associate Editor for Agriculture and Home Economics
THELMA BRACKETT, A.B., Librarian
CYNTHIA LOVEJOY, A.B., Librarian, Plant and Animal Sciences Library
MAISIE C. BURPEE, Secretary
THERESA R. BATCHELDER, Mail Clerk

Agricultural and Biological Chemistry

ARTHUR E. TEERI, PH.D., Chemist
THOMAS G. PHILLIPS, PH.D., Chemist
STANLEY R. SHIMER, M.S., Associate Chemist
GORDON P. PERCIVAL, M.S., Associate Chemist
HENRY A. DAVIS, M.S., Associate Chemist
WARREN AVERILL, PH.D., Assistant Chemist
MARGARET LOUGHLIN, M.S., Research Assistant in Agricultural and Biological Chemistry
DOROTHY JOSSELYN, Assistant in Agricultural and Biological Chemistry
VESTA STAAB, B.S., Assistant in Agricultural and Biological Chemistry

Agricultural Economics

WILLIAM F. HENRY, M.S., Economist
WINFRED K. BURKETT, PH.D., Associate Economist
JAMES R. BOWRING, PH.D., Associate Economist
LAWRENCE A. DOUGHERTY, B.S., Assistant Economist
GEORGE B. ROGERS, M.S., Assistant Economist
OWEN B. DURGIN, M.A., Sociologist
GEORGE FRICK, M.S., B.A.E., Cooperator

Agricultural Engineering

ROBERT S. PALMER, B.S.A.E., Assistant Agricultural Engineer

Agronomy

ROY L. DONAHUE, PH.D., Agronomist
FORD S. PRINCE, B.S., Agronomist
LEROY J. HIGGINS, B.S., Associate Agronomist
ALLAN B. PRINCE, PH.D., Associate Agronomist
PAUL T. BLOOD, M.S., Assistant Agronomist
GERALD M. DUNN, PH.D., Assistant Agronomist
SCOTT A. MILLER, JR., PH.D., Assistant Agronomist
WALTER LYFORD, M.S., Soil Surveyor
BESSIE G. SANBORN, Seed Analyst
DONALD A. EMERY, B.S., Graduate Research Assistant
MARTIN A. TOWNSEND, B.S., Graduate Research Assistant
KENNETH H. MACKAY, B.S., Graduate Research Assistant

Bacteriology

Lawrence W. Slanetz, ph.d., Bacteriologist
William A. Ayers, ph.d., Assistant Bacteriologist
Fred E. Allen, d.v.m., Veterinarian
Agnes T. Richardson, b.s., Laboratory Assistant
George A. Coronis, b.a., Graduate Research Assistant
Dona Claire Hooper, b.s., Graduate Research Assistant
Joseph Marelli, Departmental Technician

Botany

Albion R. Hodgdon, ph.d., Plant Taxonomist
Stuart Dunn, ph.d., Plant Physiologist
Charlotte G. Nast, ph.d., Associate Cytologist
Avery Rich, ph.d., Plant Pathologist
Judith Dorr, b.s., Graduate Research Assistant
Arthur D. Partridge, b.s., Graduate Research Assistant
Graydon Kingsland, b.a., Graduate Research Assistant
Robert F. Becker, b.s., Graduate Research Assistant
Subhash C. Datta, m.s., Graduate Research Assistant
Sanat K. Majumder, m.s., Graduate Research Assistant

Dairy Husbandry

Kenneth S. Morrow, m.s., Dairy Husbandman
Harry A. Keener, ph.d., Dairy Husbandman
Herbert C. Moore, m.s., Associate Dairy Husbandman
Nicholas F. Colovos, m.s., Associate Animal Nutritionist
C. H. Boynton, m.s., Associate Dairy Husbandman
A. D. Littlehale, Assistant in Research
Robert B. Eckberg, b.s., Graduate Research Assistant

Entomology

James G. Conklin ph.d., Entomologist
Robert L. Blickle, ph.d., Associate Entomologist
Wallace J. Morse, b.s., Research Assistant in Entomology

Forestry

Clark L. Stevens, ph.d., Forester
Lewis C. Swain, m.f., Associate Forester
Bertram Husch, ph.d., Associate Forester
Oliver Wallace, ph.d., Assistant Forester

Home Economics

Anna M. Light, ph.d., Home Economist
Beth A. Byers, b.s., Graduate Research Assistant

Horticulture

Albert F. Yeager, ph.d., Horticulturist
L. Phelps Latimer, ph.d., Associate Horticulturist
Elwyn M. Meader, m.s., Associate Horticulturist
William W. Smith, ph.d., Associate Horticulturist
Russell Eggert, m.s., Associate Horticulturist
Edward B. Risley, m.s., Assistant Horticulturist
Radcliffe Pike, m.s., Collaborator
Bruce A. Barmby, b.s., Graduate Research Assistant
Shih-an-Yu, b.s., Graduate Research Assistant

Poultry Husbandry

WINTHROP SKOGLUND, M.S., Poultry Husbandman
RICHARD RINGROSE, PH.D., Poultry Nutritionist
FRED E. ALLEN, D.V.M., Veterinarian
ALAN C. CORBETT, D.V.M., Pathologist
WILLIAM R. DUNLOP, D.V.M., Research Pathologist
*WALTER M. COLLINS, M.S., Poultry Geneticist
RICHARD G. STROUT, M.S., Assistant Pathologist
WALLIS RAND, Laboratory Assistant
DONALD A. CROSS, Senior Laboratory Technician
EDNA WOODWARD, Laboratory Technician
KATHRYN MOORE, Assistant Laboratory Technician
EMILY DONOVAN, Assistant Laboratory Technician
HARRIET N. FOGG, Assistant Laboratory Technician
WILLIAM R. SANSON, B.S., Graduate Research Assistant
RICHARD M. VONDELL, B.S., Graduate Research Assistant
GEORGE E. WOOD, B.S., Graduate Research Assistant
MATTHEW B. LONSDALE, B.S., Graduate Research Assistant

Changes in Personnel

Additions to Staff

AYERS, WILLIAM A., Assistant Bacteriologist (July 26, 1954-)
BARMBY, BRUCE A., Graduate Research Assistant in Horticulture (July 1, 1954-)
BECKER, ROBERT F., Graduate Research Assistant in Botany (July 1, 1954-)
BYERS, BETH A., Graduate Research Assistant in Home Economics (July 1, 1954-)
CORONIS, GEORGE A., Graduate Research Assistant in Bacteriology (July 1, 1954-June 30, 1955)
DATTA, SUBHASH C., Graduate Research Assistant in Botany (September 7, 1954-)
DURGIN, OWEN B., Sociologist (September 1, 1954-)
ECKBERG, ROBERT, Graduate Research Assistant in Dairy Husbandry (July 1, 1954-)
HOOPER, DONA B., Graduate Research Assistant in Bacteriolcgy (February 1, 1955-)
KINGSLAND, GRAYDON, Graduate Research Assistant in Botany (July 1, 1954-June 30, 1955)
LONSDALE, MATTHEW B., Graduate Research Assistant in Poultry Husbandry (July 1, 1954-)
MACKAY, KENNETH H., Graduate Research Assistant in Agronomy (July 1, 1954-)
MAJUMDER, SANAT K., Graduate Resetarch Assistant in Botany (February 1, 1955-)
PARTRIDGE, ARTHUR D., Graduate Research Assistant in Botany (July 1, 1954-)
PRINCE, ALLAN B., Associate Agronomist (August 5, 1954-)
RAND, WALLIS, Laboratory Assistant in Poultry Husbandry (July 1, 1954-)
ROGERS, GEORGE B., Assistant Economist (April 1, 1955-June 30, 1955)
STROUT, RICHARD, Assistant Poultry Pathologist (September 13, 1954-)
TERFANSKY, LAWRENCE, Graduate Research Assistant in Poultry Husbandry (July 1, 1944 - November 22, 1954
VONDELL, RICHARD M., Graduate Research Assistant in Poultry Husbandry (September 1, 1954-)
WOOD, GEORGE E., Graduate Research Assistant in Poultry Husbandry (July 1, 1954-)
WOODWARD, EDNA, Laboratory Technician in Poultry Husbandry (August 1, 1954-)

Losses from Staff

BARDWELL, EDWIN T., R.O.P. Inspector, (October 15, 1944 -October 31, 1954)
CHMURA, NORMAN, Graduate Research Assistant in Bacteriology (September 1, 1953-January 31, 1955)

*Leave of absence August 15, 1954 to August 15, 1955.

Coller, Donald E., Senior Laboratory Technician in Poultry Husbandry (July 1, 1953-June 18, 1955)

Coronis, George A., Graduate Research Assistant in Bacteriology (July 1, 1954-June 30, 1955)

Cross, Donald A., Senior Laboratory Technician in Poultry Husbandry (December 13, 1943-June 30, 1955)

Dorr, Judith, Graduate Research Assistant in Botany (September 1, 1953-June 30, 1955

Emery, Donald A., Graduate Research Assistant in Agronomy (July 1, 1953-June 30, 1955)

Gartner, Joseph, Graduate Research Assistant in Agricultural Economics February 1, 1954-June 6, 1955)

Kingsland, Graydon, Graduate Research Assistant in Botany (July 1, 1954-June 30, 1955)

Richardson, Agnes, Laboratory Assistant in Bacteriology (July 1, 1950-June 30, 1955)

Ritzman, Ernest G., Research Professor Emeritus of Animal Husbandry (Deceased May 15, 1955)

Rogers, George, Assistant Economist (April 1, 1955-June 30, 1955)

Sanders, Barbara, Research Assistant in Dairy Husbandry (July 1, 1953-June 17, 1955)

Sanson, William R., Graduate Research Assistant in Poultry Husbandry (August 24, 1953-June 30, 1955)

Terfansky, Lawrence, Graduate Research Assistant in Poultry Husbandry (July 1, 1954-November 22, 1954)

Townsend, Martin, Graduate Research Assistant in Agronomy (August 17, 1953-June 30, 1955)

Zoerb, Conrad, Poultry Inspector (December 1, 1947 - August 31, 1954)

Publications

Experiment Station Bulletins

412 *Inspection of Commercial Feedingstuffs.* H. A. Davis and V. F. Staab.

413 *The Population of New Hampshire. I. Trends and Characteristics.* J. R. Bowring.

414 *Inspection of Commercial Fertilizers.* H. A. Davis and V. F. Staab.

415 *Results of Seed Tests for 1954.* Bessie G. Sanborn

416 *Avian Mass Immunization for Infectious Bronchitis and Newcastle Disease.* W. R. Dunlop and R. G. Strout.

417 *Livestock Markets in New Hampshire.* J. R. Bowring.

418 *Report of the Director of the New Hampshire Agricultural Experiment Station.* H. C. Grinnell and M. C. Richards.

419 *The Effect of Texture on the Nutritive Value of Concentrates for Dairy Cattle.* N. F. Colovos, H. A. Keener, H. A. Davis, K. S. Morrow, K. S. Gibson.

420 *Marketing Forest Products in New Hampshire.* L. C. Swain and O. P. Wallace.

Station Technical Bulletin

93 *Factors Affecting the Micronutrient Element Content of Some Forages in New Hampshire.* G. P. Percival, D. Josselyn and K. C. Beeson.

Scientific Contributions

149 Dunn, Stuart, and Suzanne S. Roberts. *The Availability of Magnesium from Organic Carriers in Artificial Substrates.* Plant Phys. 29: 337-342, 1954.

156 Blickle, R. L., *Tabanidae of New Hampshire.* Psyche, 61: 74-75, 1954.

161 Teeri, A. E. *Effect of d-Amino Acids on Growth of Lactobacilli.* Jour. Bact. 67:686-688, 1954.

164 Smith, W. W. *Occurrence of "Stem Pitting" and Necrosis in Some Body Stocks for Apple Trees.* Proceedings Am. Soc. Hort. Sci. 63:101-113, 1954.

166 Keener, H. A., *The Effect of Various Factors on the Vitamin D. Content of Several Common Forages.* Jour. Dairy Sci. 37:1337-1345.

167 Dunn, Stuart and R. J. Townsend. *Propagation of Sugar Maple by Vegetative Cuttings.* Jour. For. 52:678-679, 1954.

168 Teeri, A. E. *Semi-Micro Colorimetric Determination of Calcium in Blood Serum.* Chem. Analyst 43:43, 1954.

168a Phillips, T. G., J. T. Sullivan, M. E. Loughlin and V. G. Sprague. *Chemical Composition of Some Forage Grasses. I. Changes with Plant Maturity.* Agron. Jour. 46:361-369, 1954.

169 Baker, John R. and Stuart Dunn. *Sawdust Composts in Soil Improvement. III. Pot Cultures Studies with Composts from (a) Outdoor Pits, (b) Wooden Bins with High Moisture, (c) Other Mixtures.* Plant and Soil 6:113-128, 1955.

169a Eggert, R. and L. T. Kardos *Further Results on the Absorption of Phosphorus by Apple Trees.* Proceedings Am. Soc. Hort. Sci. 64:47-51, 1954.

170 Collins, W. M., S. C. Thayer and W. C. Skoglund, *Breed and Strain Differences in Shank Pigmentation in Growing Chickens.* Jour. Poultry Sci. 34:223-228, 1955

173 Teeri, A. E., H. F. Enos, Jr., E. Pomerantz and N. F. Colovos. *The Excretion of Vitamin B_{12} by Dairy Cattle.* Jour. An. Sci. 14:268-271, 1955.

175 Blickle, R. L. *Feeding Habits of Tabanidae.* Ent. News, 66:77-78, 1955.

179 Rich, Avery E. *The Occurrence and Control of Paratylenchus Hamatus on Celery in New Hampshire.* Plant Disease Reporter. 39:307-307, 1955.

180 Rich, Avery E. *Die-Back of Asparagus Associated with Botrytis Cinerea in New Hampshire.* Plant Disease Reporter. 39:305-306, 1955.

Progress Reports

Vol. 1, No. 1:1-12
Vol. 1, No. 2:1-16

Research Mimeographs

Agricultural Economics

13 Bowring, J. R. and Joseph Gartner. *Comparing Market Efficiency in the Distribution of Milk.*

Forestry

2 Husch, B. *Use of Age at Dbh as a Variable in the Site Index Concept.*

Expenditures for the Fiscal Year Ending June 30, 1955

	Hatch	Adams	Purnell	Bankhead-Jones Section 5	Bankhead-Jones 9b 1-2	Bankhead-Jones 9b 3	Supplementing
Personal Services	$14,161.33	$14,596.14	$55,656.62	$9,605.69	$52,583.30	$12,106.14	$119,301.61
Travel	93.97	6.72	621.18	219.50	17.05	2,215.08	6,527.46
Transportation of Things	6.18	8.79	37.02	1.40	32.13	90.80	459.47
Communication Service	3.75		35.20	3.20		28.39	1,353.16
Rents and Utility Services							120.00
Printing, etc.			2.70		21.70	197.00	339.77
Other Contractual Services	5.00		73.20		371.88	849.80	568.87
Supplies and Materials	722.86	307.32	2,115.74	548.96	9,948.53	10,797.57	29,552.61
Equipment	6.91	81.03	1,458.34	984.68	702.38	3,435.22	17,032.31
Totals	$15,000.00	$15,000.00	$60,000.00	$11,363.43	$63,676.97	$29,720.00	$175,255.26

Income from Supplementary Expenditures

State Money Offsetting Federal Funds	75,040.40
State Money for Station	53,424.85
Research Sales	12,777.61
Other Income (Mostly from Private Grants)	34,012.40
	$175,255.26

630.72
N532
no.426-450
DATE DUE

NOV 4 '64	
MAY 19 '65	
Sept 24	
OCT 23 '68	
	F32a